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Agenda item 9

Technical Domain / Task Number …………………………………

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Would an international standard for machine-to-machine (M2M) interfaces benefit IALA National Members?

# Summary

Business case for the establishment of an IALA Guideline for machine-to-machine interfaces for shore-side systems.

## Purpose of the document

Request the Committee to consider completing the Draft Guideline for M2M Interfaces.

## Related documents

[ENAV16-9.20 Guideline M2M Interfacing@CSSA (2015-04-09)](http://www.iala-aism.org/media-lib/12013/enav16_9_20_guideline_m2m_interfacing_cssa_2015_04_09_.zip)

# Background

IALA National Members operate and maintain complex shore-side systems. These systems have many disparate components. Typical components or “services” are listed in the table on the next page.

Table 1: Shore-side System Components or “Services”

|  |  |
| --- | --- |
| User Interaction Service (UIA) | |
| Gateway Service (GWY) | |
| Value-added Data Processing Services | Position Determination Service (POS) |
| Ship Data Consistency Analysis Service (SDA) |
| Environmental Data Evaluation Service (ENE) |
| Vector Chart Service (VEC) |
| Shipping Industry Database Service (SID) |
| Maritime Portfolio Registry Service (MPR) |
| Maritime Messaging Service (MMS) |
| Data Mining Service (DMS) |
| Data Collection and Data Transfer Services | DGNSS Augmentation Service (DGN) |
| Aviation Communication Service (AVI) |
| Radar Service (RAD) |
| Medium Frequency Broadcast Service (MFB) |
| AIS Service (AIS) |
| Direction Finding Service (DFS) |
| NAVTEX Service (NTX) |
| VHF Communication Service (VHF) |
| GMDSS VHF DSC Service (DSC) |
| HF GMDSS Service (HFG) |
| Fixed Visual Aids Service (FXA) |
| Floating Visual Aids Service (FLA) |
| CCTV Video Service (VID) |
| Local Public Address Service (LPA) |
| Environmental Sensor Service (ENS) |

Source: Guideline 1114: A Technical Specification for the Common Shore-based System Architecture (CSSA)

Shore-based system components interact with each other to give operators situation awareness and to provide navigational aids and services to vessels (amongst iothers). National Members purchase components from a number of different vendors either directly or through a system integrator. Some IALA National Members integrate components in-house, others contract integration out to a 3rd party (i.e. Kongsberg, SAAB, Transas Marine, Denbridge Marine, others).

The task of integrating components is complex. It is complex even where components can use IEC 61162 protocols to transmit and receive data because 61162 is a rudimental, narrow band protocol that is devoid of contextual information ("meta data").

This means that each interface between two components of the system is unique and needs to be developed tested and maintained separately. A shore-side system requires that almost all its components interface with each other either directly or through other components. In a reasonably complete shore-side system this means that literally dozens of interfaces have to be custom-built, tested and maintained.

Sometimes components fail and need to be replaced, typically with a newer version that requires updated custom-built interfaces with all "neighbouring" components.

Setting up and maintaining integration of the many components of a shore-side system is labour intensive, time consuming and expensive.

# Would an international standard for machine-to-machine (M2M) interfaces benefit IALA National Members?

IALA National Members are faced with upgrading many of their shore-based system components not only because they become obsolete and are no longer supported by their vendors but also to implement new (e-navigation) services. The pace at which components become obsolete and new components have to be added is increasing steadily. As a result, the pace at which interfaces between components have to be developed and tested increases even faster, possibly by as much as an order of magnitude. This also means that the cost of maintaining interfaces between components is rising significantly.

How would an international standard for M2M interfaces help to contain these costs? What does an interface standard look like? What does it do?

A modern interface standard architecture would require vendors to describe the characteristics of the data that their components generate in a machine readable format that can be accessed and interpreted by all other components that need to interact with it. This description ("data model") doesn't just describe in detail the data a component generates it also describes what its configuration options are and how to (remotely) change them. The data model furthermore describes how to (remotely) update the component's software to a newer version. The interface standard requires that these descriptions are accessible (with proper authentication) to other components and that components keep a log of configuration changes and software upgrades.

With standard interfaces, the integration task is reduced to identifying M2M interfaces and setting up permissions that allow components to discover each other and then automatically set up data exchanges between them. The integrator will also need to specify who will be allowed to change a component's configuration and upgrade its software (through the Access Control List). The integrator will furthermore need to identify the data streams that will need to be encrypted (if any).

Simplifying integration and standardizing interfaces benefits National Members by significantly lowering component integration costs. It also will increase competition among component vendors since mixing-n-matching best in class components will become much simpler. That, in turn, will likely make more, higher quality components available to National Members that cost less. Some vendors may offer their components as cloud-based services. Interface standards will make National Members' shore-based systems truly future proof and prevent vendor lock-in.

# What will it take to establish an IALA standard for M2M interfaces?

A sub-group (CSSA Task Force) of the ENAV Committee Harmonization Workgroup (WG1) has drafted an IALA Standard for M2M Interfaces. It will take the CSSA Task Force probably two more Committee ENAV sessions and possibly an additional intersessional session to progress this draft to the point where it can be submitted to the ENAV Committee. The guideline for M2M interfaces will be based on a well-established international standard rather than attempt to developing a new standard.

# Reference

Guideline 1114: A Technical Specification for the Common Shore-based System Architecture (CSSA)

# Action requested of the Committee

The Committee is requested to consider completing the Draft Guideline for M2M Interfaces.